

The Files - RD-116, T.O.'s 2 and 3

16 March 1959

Trip Report - CS-4 and CS-8 Collection Systems

1. On 6 February 1959 the undersigned, in company with Mr. [REDACTED], SPS, visited the [REDACTED] at Ridgefield, Connecticut, to monitor progress under Tasks 2 and 3 of the subject contract. Present at the discussions were:

[REDACTED]

SPS/EA  
- OC-E/R+D-EP

2. Task Order 3 provided for the refurbishing of the CS-4 Collection System previously built and delivered by [REDACTED]. The reconditioned and improved CS-4 was delivered to the Agency in January 1959 and is currently undergoing testing and evaluation. Since most of the work under this task has been terminated, the project was not discussed at great length during the meeting.

3. Task Order 2 provides for the development of a 30 to 600 mc collection system, the CS-8, which is due to be delivered by 28 April 1959. The final electrical design of the equipment has been determined. The mechanical design of the two housings for the equipment, the chassis, and wiring layouts of the individual modules is approximately 90% complete.

4. Design and construction of a working breadboard of the variable VHF oscillator has delayed the mechanical design of the servo and sweeping system. The development of such an oscillator using only a rotary tuning motion and no sliding contacts, tunable over a range of 570 mc, has constituted a real challenge to the [REDACTED] engineers. The contractor now has a working breadboard model of such an oscillator. The tuning range extends from 830 mc to 1400 mc, and power output appears to be completely adequate for the application. A comprehensive checkout of the environmental stability of the oscillator still remains to be run, but a cursory examination indicates that the oscillator will exhibit a high degree of frequency stability.

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5. The power supply for the CS-8 utilizes a rather unique approach to the problem of supplying relatively large amounts of power from a small package. The primary AC power is converted to DC, and the converted DC is used to operate a 1600 cps oscillator. The regulated DC voltages are derived for the receiver from the 1600 cps oscillator. Total weight of this power supply which requires approximately 200 watts input power is  $4\frac{1}{2}$  pounds. Dimensions are roughly 8" x 8" x 4". For comparison, a 200-watt transformer operating directly from 50 to 400 cps line supply would weigh in the order of 7 to 11 pounds.

6. The CS-8 specifications call for an adjustable HFO which will be used both for aural monitoring and recording. During testing of the breadboard circuits, however, it became obvious that the instability of the IF oscillators would result in a frequency variation of approximately  $\pm 8$  kc in the HFO tone. [REDACTED] then suggested the use of two separate HFO circuits: (1) a 1 kc HFO for aural monitoring with an adjusting control to compensate for drift, and (2) an 8 kc non-adjustable HFO tone for unattended recording. It was felt that the 8 kc tone would be sufficiently high in frequency to prevent the tone from drifting through zero beat, with resultant loss of information on the tape. However, this HFO tone would still drift lower than 1 kc and higher than 15 kc. Because of an operational requirement which provides for the occasional use of a standard audio recorder for unattended monitoring, the higher upper frequency limit of 15 kc made this plan impractical. It was therefore decided to adopt the following HFO arrangements:

- (1) One HFO tone, centered on zero beat, shall be provided.
- (2) This HFO shall have a tone control permitting a frequency variation of  $\pm 5$  kc.
- (3) An additional control switch shall change the HFO frequency to 30 kc below the center frequency to permit beating against the lower sideband.

7. [REDACTED] will deliver two preliminary instruction manuals with the first CS-8 prototype. These initial instruction manuals will cover the basic operating instructions and include some drawings. At a later date (allowing time for drafting final circuit diagrams, etc.) the finalized manuals of operation and maintenance and the final engineering report will be submitted.

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